

**REMARKS**

Applicant requests favorable reconsideration and allowance of this application in view of the foregoing amendments and the following remarks.

Claims 37 to 60 are now pending in this application, with claims 37 and 49 being independent. Claims 1-36 have now been canceled, without prejudice to or disclaimer of the subject matter recited therein. Support for the claim amendments can be found throughout the specification including, for example, in Figure 1 and in the corresponding discussion of Figure 1 in the specification (e.g., *see* page 19 *et seq.* of the English-language specification).

In the Office Action, claims 1-5, 9-12 and 20-36 have been rejected under 35 U.S.C. § 102(f) on the basis that Applicant did not invent the claimed subject matter, since Applicant's gene detection system allegedly was fully disclosed in U.S. Patent No. 6,749,731 to Kobori et al.

The Office Action also has identified claims 1-5, 9-12 and 20-36 as not being patentably distinct from claims 1-25 of the commonly assigned Kobori et al. patent. In view of this, it was requested that Applicant show that the inventions in this application and in the Kobori et al. patent were commonly owned at the time the invention in this application was made or to name the prior inventor of the conflicting subject matter. If the former is shown, the Office Action noted that this will preclude a rejection under 35 U.S.C. § 103(a) based on the Kobori et al. patent as a reference under 35 U.S.C. § 102(e), (f) or (g).

Moreover, claims 1-5, 9-12 and 20-36 have been rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of the Kobori et al. patent. (In this regard, although the Office Action identifies the relevant patent as being "U.S. Patent No. 7,749,731," Applicant believes that this is, in fact, a typographical error and that the patent in question is actually U.S. Patent No. 6,749,731 to Kobori, et al.)

In addition, claims 1, 10, 24 and 30 have been rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,386,851 to Baumann et al.

As well, claims 1-5, 10-12, 21, 23-28, 30-32, 34 and 36 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,126,800 to Caillat et al. in view of Baumann et al.

Claims 9, 22, 29 and 35 also have been rejected under 35 U.S.C. § 103(a) as obvious over Caillat et al. in view of Baumann et al. as applied to claims 1 and 24, and further in view of U.S. Patent No. 5,866,321 to Matsue et al.

Finally, claims 20 and 33 have been rejected under 35 U.S.C. § 103(a) as obvious over Caillat et al. in view of Baumann et al. as applied to claims 1 and 24, and further in view of U.S. Patent No. 4,857,831 to Davies et al.

In view of the claim amendments provided above, the rejections and objections set forth in the Office Action, which Applicant respectfully traverses, are moot for the reasons provided below.

Currently pending independent claim 37 recites a gene detection system for detecting a target gene upon hybridization with a probe, said gene detection system comprising: an electrode substrate having a first surface and a second surface, the first surface being opposite to the second surface through the electrode substrate; an electrode provided on the first surface, the electrode having a probe immobilizing surface; a soaking component provided on the second surface; heating and cooling means provided on the soaking component; and a heat insulating member covering a circumferential surface of the electrode, wherein a thermal capacity of the soaking component is greater than that of the electrode substrate.

Moreover, currently pending independent claim 49 recites a gene detection system comprising: an electrode substrate having a first surface and a second surface, the first surface being opposite to the second surface through the electrode substrate; a cylindrical electrode projecting from the first surface of the electrode substrate, wherein a probe-immobilizing surface of the cylindrical electrode is disposed away from the electrode substrate, and wherein an insulating member substantially covers a circumferential surface of the cylindrical electrode; a soaking component provided on the second surface; and heating and cooling means disposed in contact with the soaking component, wherein a thermal capacity of the soaking component is greater than that of the electrode substrate.

According to Applicant's understanding, none of the cited references, taken individually or in combination, teaches or suggests Applicant's claimed invention as set forth either in independent claim 37 or independent claim 49.

U.S. Patent No. 6,749,731 to Kobori et al. discloses a gene detection chip comprising a plurality of pins as measurement electrodes, a common electrode as a counter electrode therefor, and a tabular member with a plurality of pin holes for accommodating the pins. Moreover, the disclosure in the Kobori et al. patent teaches that the pins may be coated with a resin such that a gene can only be immobilized "on the exposed portion (located at the end opposite from the base end of the pin fixedly supported on the supporting member)" (see, e.g., col. 1, lines 60-61 and

col. 4, lines 22-34). The Kobori, et al. patent also discloses various embodiments by which to produce a tightly-fitted, airtight connection between a pin and a corresponding pin hole (*see e.g.*, col. 2, lines 22 *et seq.* and col. 8, lines 43-55). However, Kobori et al. does not teach Applicant's claimed invention, for example as recited either in claims 37 or 49, including the feature of heating and cooling means and a soaking component that is opposite to the electrode through an electrode substrate. In this regard, *see, e.g.*, page 5, lines 16-23 of the English version of the present application. Accordingly, it is believed that Applicant's presently claimed invention is patentably distinct from the invention disclosed in Kobori et al. Moreover, Applicant finds that Kobori et al., taken alone or in combination with the other patent documents cited in the Office Action, does not disclose or suggest Applicant's claimed invention, for example as set forth either in independent claims 37 or 49.

U.S. Patent No. 6,368,851 B1 to Baumann et al. teaches a method for measuring at least one state variable of a biological cell located in a nutrient medium, the cell being supported on and adhering to a support area. More specifically, at col. 6, lines 43-50, Baumann et al. discloses the use of a laser beam to heat and open a cell membrane. However, Baumann et al. does not, for example, disclose Applicant's claimed invention, as set forth in either claims 37 or 49, including heating and cooling means and a soaking component that are opposite to the electrode via an electrode substrate. Consequently, Baumann et al., taken alone or in combination, does not teach or suggest Applicant's claimed invention as recited in independent claims 37 or 49.

U.S. Patent No. 6,126,800 to Caillat et al. discloses a micro-system with an integrated cuvette for the analysis of liquids comprising a chip support having a cuvette, at least one chip arranged in the cuvette, and connection means. As described in column 4, lines 19-23 of Caillat et al., this system further comprises means for heating the chip, which is integrated under the chip, either directly in the substrate of the chip or in the chip support. Moreover, Caillat et al. teaches, at col. 5, lines 36-39, that the temperature may be controlled "by a thermocouple that extends into the cuvette in order to measure the temperature of a liquid that it contains." However, Caillat et al. does not disclose Applicant's claimed invention, as set forth in either claims 37 or 49, including heating and cooling means and a soaking component that are opposite to the electrode via an electrode substrate. In this regard, compare Figure 1 of the present application with Figures 5 and 7 of the Caillat et al. patent. A unique, advantageous effect of the claimed invention in this application is to provide the gene detection system in which a

temperature of a solution near the probe-immobilizing surface dipped in the solution is controlled. As noted at page 5, lines 16-23 of the English specification:

An extremely low volume is subject to temperature control in the present invention because only the temperature of the solution near the surface of the probe-immobilizing support dipped in the solution is controlled while the probe-immobilizing support is at least either heated or cooled by the heating and cooling means, resulting in a drastically shorter time to reach Tx, while also enabling rapid, highly sensitive detection.

Consequently, Applicant believes that Caillat et al., taken alone or in combination with any of other documents identified in the Office Action, does not teach or suggest Applicant's claimed invention as recited in independent claims 37 or 49.

Finally, neither U.S. Patent No. 5,866,321 ("Matsue et al.") nor U.S. Patent No. 4,857,831 ("Davies et al.") teaches the various claimed features in independent claims 37 or 49, including a heating and cooling means and a soaking component that are opposite to the electrode via an electrode substrate. According to Applicant's understanding, Matsue et al. relates to an analytical method in which an analyte and a reactant that reacts with said analyte either directly or indirectly are allowed to react on the analytical areas of a substrate, with the resulting signals being detected for qualitative or quantitative analysis of the analyte and in which the signals derived from the reaction on the analytical areas of the substrate are detected more intensely than those derived from the non-analytical areas, thereby allowing for higher precision in the analysis of the analyte. According to Applicant's understanding of the Matsue et al. patent, the only description of temperature regulation in the device contemplated in Matsue et al. is a thermal cycler for use in DNA amplification (*see col. 8, line 55 et seq.*) Moreover, according to Applicant's understanding, U.S. Patent No. 4,857,831 to Davies et al. is directed to an apparatus and method for investigating a borehole casing. Thus, neither Matsue et al. nor Davies et al., taken alone or in combination with the other documents cited in the Office Action, teaches or suggests all the features of Applicant's claimed invention, for example as set forth in independent claims 37 or 49.

In view of all of the above, Applicant submits that this Amendment clearly places this application in condition for allowance, and that both the independent and dependent claims should be deemed allowable. Applicant also believes that the dependent claims are allowable, in

their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims.

Applicant requests that the Examiner contact Applicant's undersigned representative should any matters be deemed outstanding, precluding allowance of this application. Applicant further requests favorable reconsideration, withdrawal of the rejections and objections set forth in the outstanding Office Action, and an early Notice of Allowance.

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Respectfully submitted,

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